Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

Canadian Science Advisory Secretariat
Maritimes Region | Science Response 2018/033

STOCK STATUS UPDATE FOR SCALLOP (*PLACOPECTEN MAGELLANICUS*) IN SCALLOP FISHING AREA 29 WEST OF LONGITUDE 65°30'

Context

Advice on the status of Scallops in Scallop Fishing Area (SFA) 29 West of Longitude 65°30' (herein referred to as SFA 29 West) is requested annually by Fisheries and Oceans Canada (DFO) Resource Management to help determine a Total Allowable Catch (TAC) and estimate risk of different harvest scenarios in support of the fishery. Scallop in SFA 29 West are assessed on a multiyear schedule, with update reports produced in interim years. The last full assessment of SFA 29 West was conducted in 2015 (DFO 2015; Sameoto et al. 2015) and is updated annually (DFO 2016; 2017).

The objectives of this Science Response are to update the status of the SFA 29 West Scallop stocks in 2017, evaluate the bycatch of non-target species from information that may be available during the 2017 fishery, and evaluate the consequence of various harvest levels for the 2018 fishery.

This Science Response Report results from the Science Response Process of March 12, 2018, on the Stock Status Update of Scallop Fishing Area (SFA) 29 West Scallop.

Background

Population surveys have been conducted annually in SFA 29 West by Fisheries and Oceans Canada (DFO) Science since 2001. The survey occurs in September/October after the fishery has closed. The current survey design uses the Scallop habitat suitability map developed by Brown et al. (2012) and bins habitat suitability probabilities into three categories defined by the following ranges: Low [0, 0.3), Medium [0.3, 0.6), and High [0.6, 1.0). Habitat suitability represents a relative probability scale of suitable Scallop habitat, with the lowest suitable Scallop habitat indicated by 0 and the highest suitable habitat indicated by 1. The population dynamics of commercial and recruit Scallops are modelled using the state-space habitat-based assessment model as defined by Smith et al. (2015). Throughout this update, Scallops with a shell height of 100 mm and greater are referred to as commercial size. Scallops with a shell height of 90–99 mm are referred to as recruits and are expected to grow to commercial size in the following year. Scallops with shell height less than 90 mm are considered pre-recruits.

In this update, Scallop removals include all commercial landings from SFA 29 West and Food, Social, and Ceremonial (FSC) catch by scallop drag. Landed recreational and FSC catch by dip netting, diving, tongs, and hand are not available and not accounted for in the assessment.

Description of the Fishery

Scallop Fishing Area 29 encompasses a very large area inside the 12-mile territorial sea, from the south of Yarmouth (latitude 43°40'N) to Cape North in Cape Breton. This update refers to only that portion of SFA 29 West of longitude 65°30'W continuing north to Scallop Production

Canada

Area 3 at latitude 43°40'N (Figure 1). The season for this fishery generally runs from the third week of June to the end of August with the duration of the fishery variable each year. This area is fished by the Full Bay (FB) Fleet and inshore East of Baccaro licence holders who are authorized to fish in SFA 29 West (hereafter referred to as the EoB Fleet). The SFA 29 West fishery has occurred since 2001. The fishery is managed using limited entry, seasonal closures, minimum shell height, and meat count. Both fleets operate under an Individual Transferable Quota (ITQ) system in this area. The TACs are set and landings are reported in terms of meat weights (adductor muscles).

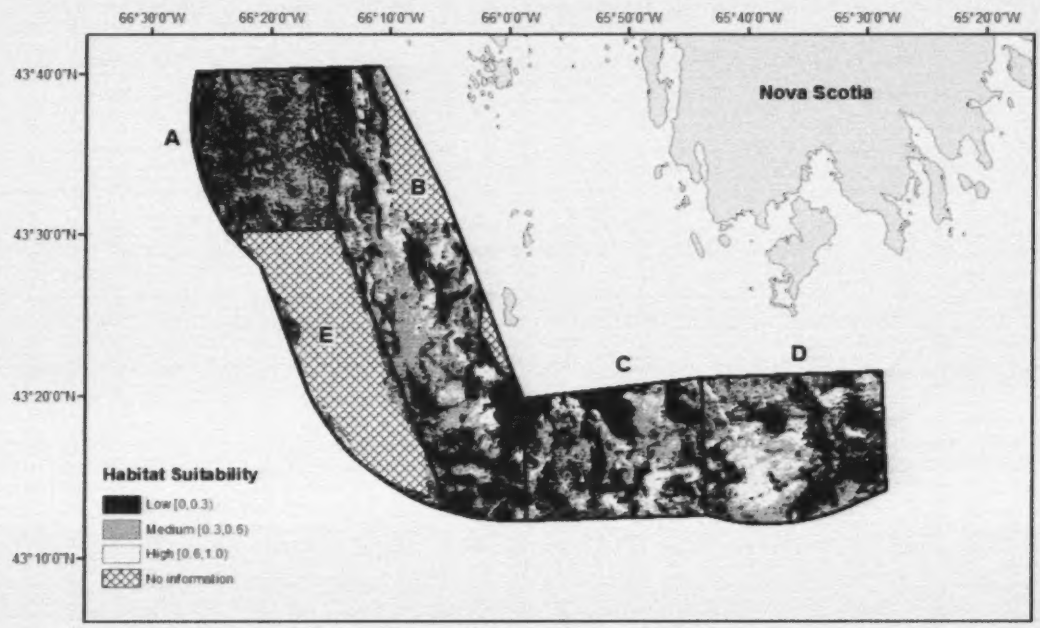

Figure 1. SFA 29 West Subareas A to E. Shaded areas show habitat suitability probability categories: Low [0, 0.3) in black, Medium [0.3, 0.6) in grey, and High [0.6, 1.0) in white (see Brown et al. 2012). Note: SFA 29 extends along the shoreline to Cape North in Cape Breton.

Analysis and Response

Commercial Fishery

Since 2002, the TAC (meat weight) has been shared between the FB and EoB fleets. As of 2010, the TAC and landings are reported for both fleets combined. In 2017, a total of 135.9 tonnes of meats (t) were landed against the TAC of 140 t. There was an additional FSC catch of 9.9 t (Figure 2).

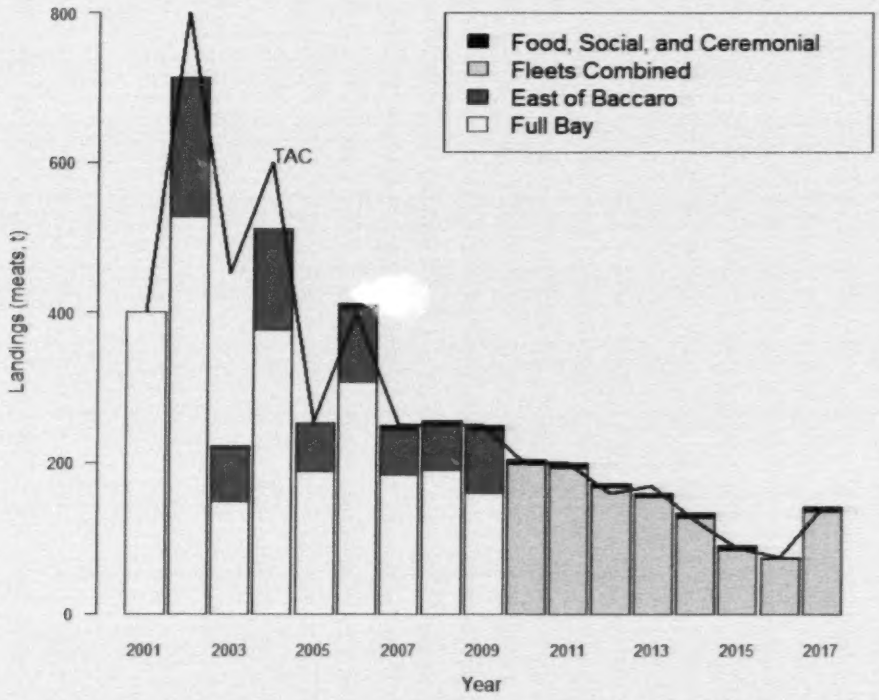

Figure 2. Annual Scallop landings (meats, t) from 2001 to 2017 for Scallop Fishing Area 29 West and the total allowable catch (TAC, black line). Note that the Food, Social, and Ceremonial landings do not count against the TAC.

In 2017, the Scallop fishery in SFA 29 West occurred in Subareas A, B, C, D, and E (Appendix 1). For Subarea A, commercial biomass was projected to decline in 2015 and 2016 even with zero catch in this Subarea (DFO 2015; DFO 2016). The fishery in Subarea A was subsequently closed in 2015 and 2016. Although declines were also projected for 2017 (DFO 2017), the fishery in Subarea A was opened. The fishing plan for Subarea A included a dedicated quota of 15 t and fishing trips to Subarea A could not hail and move to any other subarea (i.e. vessels could not fish Subarea A and another subarea during the same trip). To collect additional information on Subarea A, a voluntary Science log was provided for reporting catch and effort information at a higher resolution than the mandatory logbooks (6 hour watches versus daily reporting). The Full Bay Fleet completed voluntary science logs for 7 trips and it was possible to use information from 5 of these trips (14 sea days); from the science logs the average catch rate in Subarea A was 13.9 kg/h.

In 2017, Subarea A catch rates calculated from fishing logs for the FB and EoB Fleets were 14.2 kg/h and 10.2 kg/h, respectively. Subarea B catch rates for the FB Fleet increased from 2016 to 2017 (27.5 kg/h in 2016 and 30.4 kg/h in 2017). The EoB Fleet catch rate in Subarea B was 22.1 kg/h in 2017; however, due to *Privacy Act* considerations, catch rate data from 2016 for the EoB Fleet cannot be reported. In Subarea C, catch rates for the FB Fleet increased from 2016 to 2017 (23.9 kg/h in 2016 to 34.5 kg/h in 2017) and for the EoB Fleet (19.5 kg/h in 2016 to 32.2 kg/h in 2017). In Subarea D, there were increases in catch rates for both fleets: from 67.7 kg/h in 2016 to 72.2 kg/h for FB in 2017 and from 44.3 kg/h in 2016 to 72.7 kg/h for EoB in 2017. These were the highest catch rates in Subarea D since 2005 for the FB Fleet, and the

highest on record for the EoB Fleet. The FB Fleet did not fish in Subarea E in 2017 and due to *Privacy Act* considerations, catch rate data for the EoB Fleet cannot be reported.

Research Survey

In 2017, commercial sized Scallops were observed throughout the majority of the survey area in SFA 29 West, with the highest densities in Subareas C and D (Figure 3). In Subarea A, the number of commercial sized Scallops decreased in the Medium habitat category and remained similar in the Low habitat category (there is no High category habitat in Subarea A). In Subarea B, commercial sized Scallop abundances decreased in the High, Medium, and Low habitat categories. In Subarea C, commercial sized Scallop abundances decreased in High habitat, increased in Medium habitat, and remained similar in Low habitat. In Subarea D, commercial sized Scallop abundances decreased in Low habitat, remained similar in Medium habitat, and increased in the high habitat category.

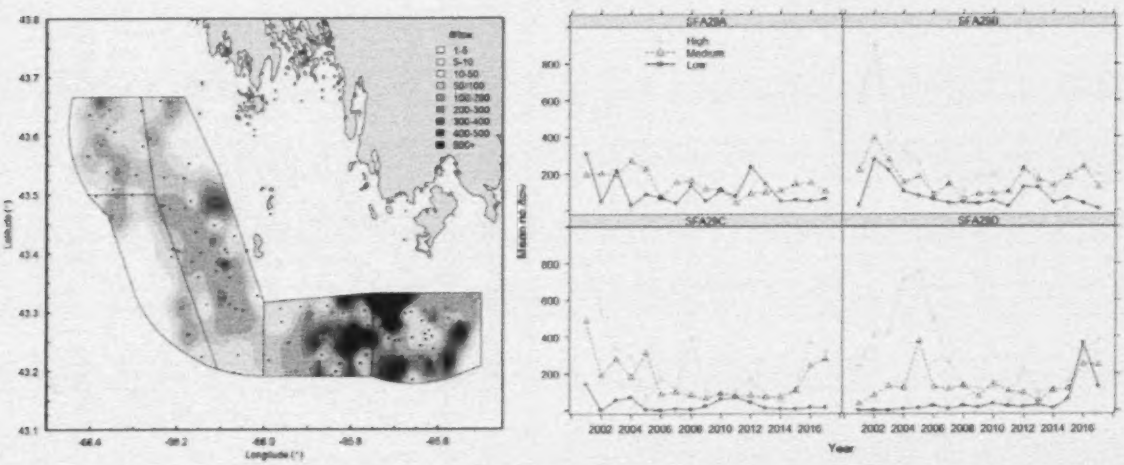

Figure 3. Commercial Scallops (≥ 100 mm shell height). On left: spatial density (numbers/tow) distribution from the 2017 survey for SFA 29 West. Points represent tow locations. On right, mean number per tow by subarea from 2001 to 2017 for Low [0, 0.3) (black circles), Medium [0.3, 0.6) (red triangle), and High [0.6, 1.0) (green crosses) categories of habitat suitability probabilities.

In 2017, the abundance of recruit sized Scallops was patchy with the highest densities in Subareas C and D (Figure 4). In Subarea A, recruit abundances remained similar in both the Medium and Low habitat category. In Subarea B recruit abundance increased in the High, and declined in the Medium and Low habitat category. In Subareas C and D, recruit abundance decreased in all habitat categories.

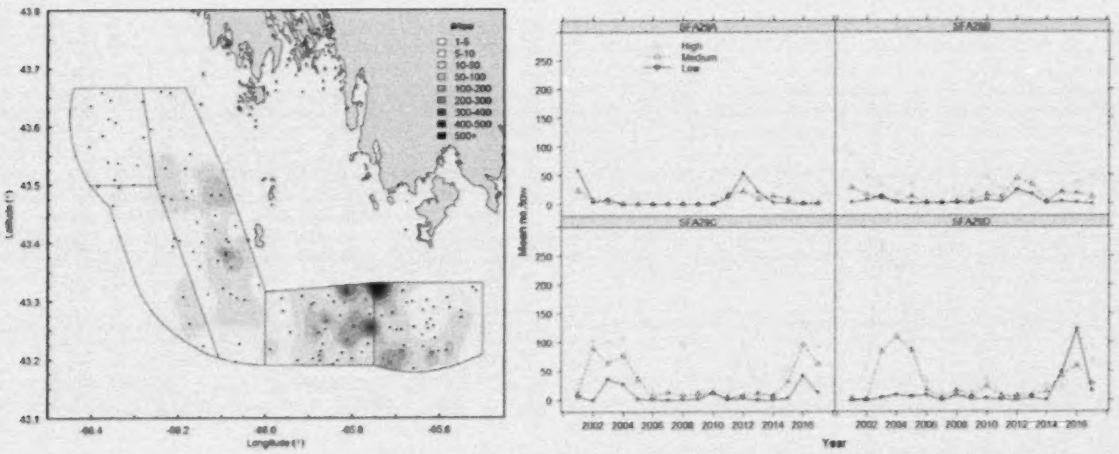

Figure 4. Recruit Scallops (90-99 mm shell height). On left: spatial density (numbers/tow) distribution from the 2017 survey for SFA 29 West. Points represent tow locations. On right, mean number per tow by subarea from 2001 to 2017 for Low [0, 0.3) (black circles), Medium [0.3, 0.6) (red triangle), and High [0.6, 1.0) (green crosses) categories of habitat suitability probabilities.

In 2017, the abundance of pre-recruit sized Scallops was patchy, with the highest densities in Subareas C and D (Figure 5). In Subarea A, pre-recruit abundances in 2017 increased from 2016 in both habitat categories. There was a slight decline in pre-recruit abundance in all habitat categories in Subarea B. In Subarea C, pre-recruit abundance in the Medium habitat category increased, and declines were observed in High and Low habitats. In Subarea D, pre-recruit abundances decreased in all habitat categories.

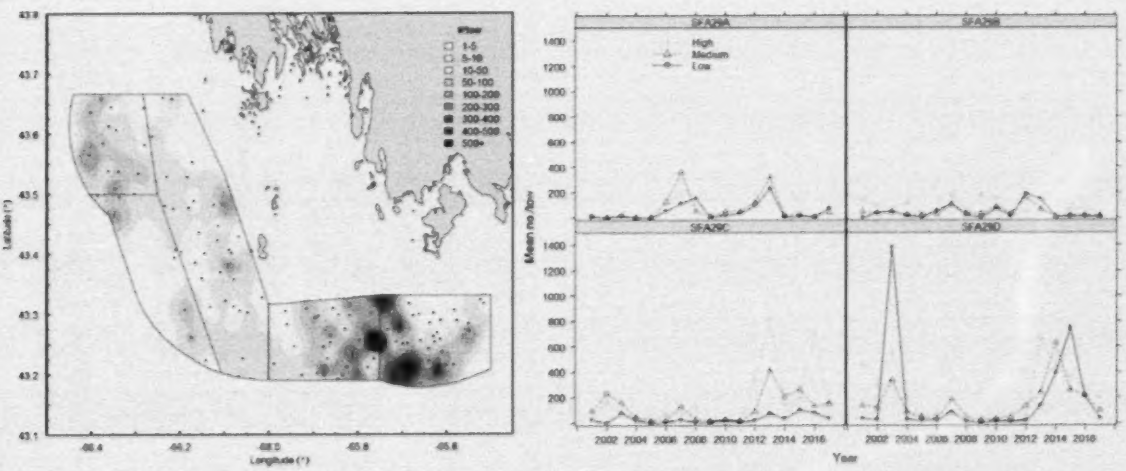

Figure 5. Pre-recruit Scallops (< 90 mm shell height). On left, spatial density (numbers/tow) distribution from the 2017 survey for SFA 29 West. Points represent tow locations. On right, mean number per tow by subarea from 2001 to 2017 for Low [0, 0.3) (black circles), Medium [0.3, 0.6) (red triangle), and High [0.6, 1.0) (green crosses) categories of habitat suitability probabilities.

Subarea E was not surveyed between 2005-2012, as it was considered a marginal area and less of a survey priority. Since 2012, a small number of stations (5-8 per year) have been

surveyed each year. Since 2014, the tows have been allocated within a portion of Subarea E known to have been historically fished. Therefore, trends in survey abundance in Subarea E may not be indicative of trends in the subarea as a whole. Commercial Scallop numbers decreased from 152.2/tow in 2016 to 91.2/tow in 2017, and a decline in recruits was also observed (7.4/tow and 6.9/tow for 2016 and 2017, respectively). Density of pre-recruits increased from 19.7/tow in 2016 to 41.2/tow in 2017.

Throughout SFA 29 West, Scallop condition during the survey (measured in grams per cubic decimeter (g/dm^3)) ranged from 10.8 g/dm^3 (Subarea A) to 11.1 g/dm^3 (Subarea C). There was an increase in condition across all subareas from 2016 to 2017 (maximum increase of 0.9 g/dm^3).

Assessment Model

The state-space habitat-based population model accepted at the framework assessment in February 2014 (Smith et al. 2015) was fit within each habitat suitability category for Subareas A to D. The model was fit to the commercial catch, effort derived from vessel monitoring system, and survey data. Subarea E is not covered by the habitat suitability map and is not modelled.

Model Exploitation

Model estimated exploitation was 0.2 or less in all subareas in 2017 (Figure 6). Subarea A reopened to fishing after a two year closure, with an exploitation of 0.1 in the Medium and 0.04 in the Low habitat categories. Exploitation in Subarea B increased from 2016 in the High (0.02 to 0.07 in 2017) and was similar to 2016 in the Medium and Low habitat categories. Exploitation was similar to 2016 in Subarea C Low and Medium habitats and increased in the High (0.04 to 0.08 in 2017). In Subarea D, exploitation increased from 2016 in all habitat categories. Exploitation increased from 0.09 to 0.17 in 2017 in the High habitat, from 0.03 to 0.08 in the Medium habitat, and from 0.02 to 0.04 in the Low habitat.

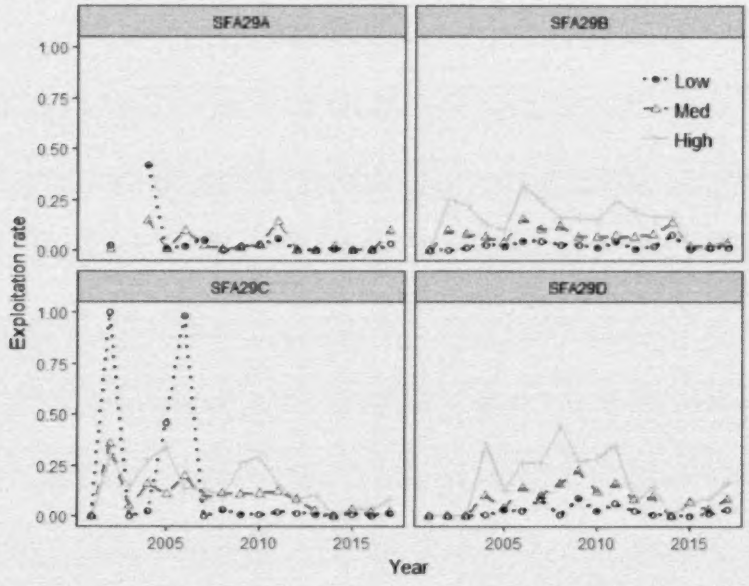

Figure 6. Model estimate of exploitation by Low [0, 0.3) category (black circles), Medium [0.3, 0.6) category (red triangles), and High [0.6, 1.0) category (green crosses) habitat suitability probabilities in SFA 29 West from 2001 to 2017.

Indicators of the Stock Status

The index associated with stock productivity for the DFO precautionary approach for SFA 29 West is commercial biomass density (t/km^2) in the High habitat suitability areas of Subareas B, C, and D (Figure 7). Lower Reference Points (LRPs) for Subareas B, C, and D were established in the fall of 2015, and Upper Stock Reference Points (USRs) were established in the fall of 2016. There are no reference points for Subareas A and E.

In 2017, commercial biomass density in Subarea A was similar to 2016 in the Low habitat category (0.5 t/km^2), and declined to 0.8 t/km^2 in the Medium habitat. Commercial biomass density in Subarea B decreased in all habitat categories. In 2017, commercial biomass density in the High habitat category of Subarea B was 2.05 t/km^2, which is above the LRP of 1.12 t/km^2 but below the USR of 2.24 t/km^2. Commercial biomass density in Subarea C decreased in the High habitat, increased in the Medium habitat, and remained similar in the Low habitat category. Commercial biomass density in the High category of Subarea C in 2017 was 5.09 t/km^2, which is above the USR of 2.82 t/km^2. Commercial biomass density in Subarea D increased in the High habitat and decreased in the Medium and Low habitat categories. Commercial biomass density in the High category of Subarea D in 2017 was 3.7 t/km^2, which is above the USR of 2.6 t/km^2.

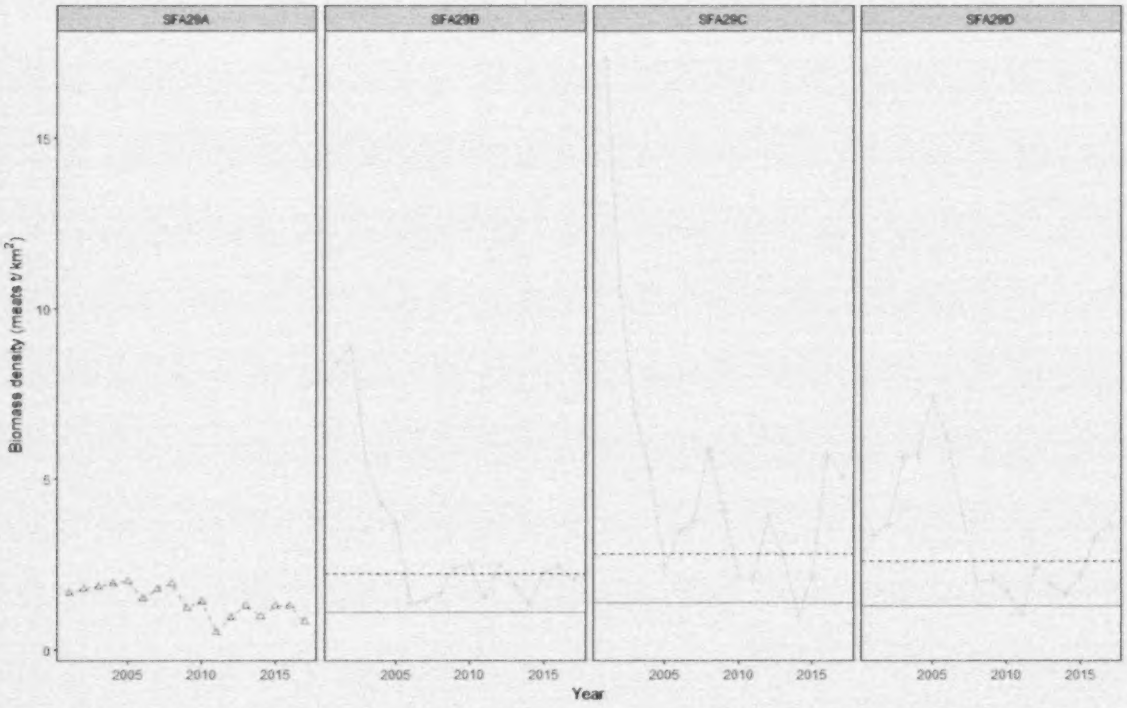

Figure 7. Commercial biomass densities (t/km^2) in SFA 29 West. In Subarea A the Medium suitability category is shown, while the High suitability categories are shown for Subareas B, C, and D. The lower reference points are indicated by the solid red line and upper stock references indicated by the dashed black line for Subareas B, C, and D.

In 2016, elevated levels of natural mortality appeared in Subarea D and have continued in 2017 (0.5 in High habitat); elevated mortality has also been observed in Subarea C (0.68 in High habitat). Scallops from Subarea D were collected during the 2016 fishery and sent to Fisheries

and Oceans Shellfish Health Unit for testing; however, the lab did not detect anything in their analysis to explain the increased mortality. During the 2017 research survey of SFA 29 West live scallops were assessed in Subareas C and D for visual signs of disease or weakening, however, no scallops were observed to meet this criteria.

Harvest Level Scenarios for 2018

These catch scenarios for 2018 assume current year (2017) estimates of condition and growth, estimates of observed recruit abundance, and the mean of natural mortality estimates from the last 5 years (2013 to 2017) within each subarea. In Subarea D, the projected natural mortality (0.22) was 55% lower than the natural mortality estimate for 2017. In Subarea C, the projected natural mortality (0.24) was 65% lower than the mortality estimate for 2017. If natural mortality continues to remain high in 2018, biomass estimates are expected to be overestimated.

Catch, exploitation, percent change in commercial biomass, probability of biomass decline, and the probability of exceeding the reference points were determined from the model for a range of potential catches and are presented as catch scenario tables for Subareas A–D in Tables 1–4.

Note that for Subarea A, biomass declines are predicted even if no catch is taken in 2018. This is partially due to the elevated natural mortality in the subarea (> 0.2 since 2011), and the continued low levels of recruitment.

An example of how to interpret the catch scenarios in Tables 1–4 is presented using Table 2 for Subarea B. In this subarea, a catch of 18 t corresponds to an exploitation of 0.06 in the High habitat category and is projected to result in a 7.8% biomass increase in the High habitat category. The probability of a biomass increase in the High habitat category is 0.55. The model predicts an increase in biomass for all of Subarea B of 5.3%; the associated probability of biomass increase for all of Subarea B is 0.56. After that catch is removed, the probability of being above the LRP is 0.85, and the probability of being above the USR is 0.51.

Table 1. Catch scenario table for SFA 29 West Subarea A to evaluate 2018 total subarea catch levels in terms of exploitation (e), expected changes in biomass (%) and probability (Pr.) of biomass increase. Note, Subarea A has no High suitability habitat.

	Medium Habitat Suitability Category			Whole Subarea	
Catch (t)	e	Expected % Change	Pr. Increase	Expected % Change	Pr. Increase
0	0	-18.3	0.36	-14.6	0.36
2	0.02	-19.4	0.35	-15.6	0.35
5	0.04	-21.4	0.34	-17.1	0.34
7	0.06	-23	0.33	-18.6	0.32
10	0.08	-24.6	0.31	-20.2	0.31
12	0.10	-26.2	0.30	-21.3	0.30
15	0.12	-27.6	0.29	-22.8	0.28
17	0.14	-29.2	0.28	-24.5	0.27
20	0.16	-30.6	0.27	-25.6	0.26
22	0.18	-32	0.26	-26.9	0.25

Table 2. Catch scenario table for SFA 29 West Subarea B to evaluate 2018 total subarea catch levels in terms of exploitation (e), expected changes in biomass (%), probability (Pr.) of biomass increase, and probability of being above the Lower Reference Point (LRP: 1.12 t/km^2) and Upper Stock Reference (USR: 2.24 t/km^2).

	High Habitat Suitability Category					Whole Subarea	
Catch (t)	e	Expected % Change	Pr. Increase	Pr. > LRP	Pr. > USR	Expected % Change	Pr. Increase
0	0	14.3	0.60	0.87	0.54	8.7	0.60
6	0.02	12.9	0.59	0.87	0.54	7.7	0.59
12	0.04	10.3	0.57	0.86	0.52	6.3	0.58
18	0.06	7.8	0.55	0.85	0.51	5.3	0.56
24	0.08	5.8	0.54	0.85	0.49	4.1	0.55
29	0.10	3.5	0.52	0.84	0.48	2.9	0.54
35	0.12	1.2	0.51	0.83	0.47	1.8	0.52
41	0.14	-1.5	0.49	0.82	0.45	0.7	0.51
47	0.16	-3.5	0.47	0.82	0.44	-0.4	0.50
53	0.18	-5.8	0.46	0.81	0.42	-1.6	0.48

Table 3. Catch scenario table for SFA 29 West Subarea C to evaluate 2018 total subarea catch levels in terms of exploitation (e), expected changes in biomass (%), probability (Pr.) of biomass increase, and probability of being above the Lower Reference Point (LRP: 1.41 t/km^2) and Upper Stock Reference (USR: 2.82 t/km^2).

	High Habitat Suitability Category					Whole Subarea	
Catch (t)	e	Expected % Change	Pr. Increase	Pr. > LRP	Pr. > USR	Expected % Change	Pr. Increase
0	0	5.7	0.53	0.92	0.76	22.6	0.71
11	0.02	2.8	0.51	0.91	0.75	20.7	0.69
22	0.04	1.1	0.51	0.91	0.75	19.6	0.68
33	0.06	-0.2	0.50	0.91	0.74	18.3	0.67
43	0.09	-2.4	0.49	0.90	0.73	16.8	0.66
54	0.11	-3.3	0.48	0.90	0.73	15.4	0.65
65	0.13	-5.8	0.47	0.90	0.72	13.7	0.64
76	0.15	-7.5	0.46	0.89	0.71	12.4	0.62
87	0.17	-9.7	0.45	0.89	0.70	11.1	0.61
98	0.19	-11.3	0.44	0.89	0.70	9.7	0.60

Table 4. Catch scenario table for SFA 29 West Subarea D to evaluate 2018 total subarea catch levels in terms of exploitation (e), expected changes in biomass (%), probability (Pr.) of biomass increase, and probability of being above the Lower Reference Point (LRP: 1.3 t/km^2) and Upper Stock Reference (USR: 2.6 t/km^2).

	High Habitat Suitability Category					Whole Subarea	
Catch (t)	e	Expected % Change	Pr. Increase	Pr. > LRP	Pr. > USR	Expected % Change	Pr. Increase
0	0	5.4	0.54	0.95	0.74	-9.5	0.37
8	0.02	3.5	0.53	0.95	0.74	-10.3	0.36
16	0.04	1.7	0.51	0.95	0.73	-11.3	0.35
24	0.06	0	0.50	0.94	0.72	-12.1	0.34
33	0.08	-2.2	0.48	0.94	0.70	-13.1	0.33
41	0.10	-4.2	0.47	0.94	0.69	-14.1	0.31
49	0.12	-5.9	0.45	0.93	0.68	-14.8	0.30
57	0.14	-7.8	0.43	0.93	0.67	-15.6	0.29
65	0.16	-9.9	0.42	0.92	0.66	-16.6	0.28
73	0.18	-12	0.40	0.92	0.64	-17.5	0.27

In Subarea E, abundance of commercial and recruit sized Scallop in 2017 decreased relative to 2016. The FB Fleet did not fish in Subarea E in 2017, and due to *Privacy Act* considerations, catch rate data for the EoB Fleet cannot be reported. The low fishing effort in 2017 is reflected in the lowest landings (0.11 t) in the time series (2005-2017).

Ecosystem Considerations

Lobster Catch in the Fishery

In 2017, there were 468 observed tows (183 EoB Fleet and 285 FB Fleet), 29 observed days (11 EoB Fleet and 18 FB Fleet) and 8 trips observed (2 EoB Fleet and 6 FB Fleet). It was estimated that 1,765 lobsters were caught during the SFA 29 West Scallop fishery in 2017 (Table 5). This corresponds to a weight of approximately 1.1 t using the average observed carapace length (91 mm) and average weight of a lobster (0.64 kg) caught in SFA 29 West in 2017. This weight is down slightly from 2016 (1.5 t). The estimated number of lobster caught represents approximately 0.005% of the lobsters caught in the 2016/2017 Lobster Fishing Area (LFA) 34 lobster fishery and approximately 0.02% of the lobsters caught in the area of LFA 34 corresponding to SFA 29 West. In 2017, there were no observed trips in Subarea E so there are no lobster estimates for that area. Subarea B had the highest lobster bycatch estimate at 955 lobsters followed by Subarea A at 441 lobsters.

Trends in lobster catches by the lobster fishery in the SFA 29 West area as a whole are not indicative of an area that has been adversely affected by the Scallop fishery since 2001.

Table 5. Estimated total numbers of lobsters caught in the Scallop fishery (Full Bay and East of Baccaro Fleets combined) for 2015–2017 based upon observer data. DI (%) refers to the percentage of dead or injured lobsters. Dash (-) indicates no observer coverage. NA refers to not applicable.

		Observer data			Fishery	Estimated	
Year	Area	No. lobsters	DI (%)	Meats (t)	Meats (t)	No. lobsters	No. DI
2015	A	-	-	-	0	-	-
	B	118	*	2.7	15.6	682	*
	C	33	*	0.5	14.6	938	*
	D	87	*	1.3	32.7	2,181	*
	E	32	*	1.4	27.7	631	*
	Total	**270**	**NA**	**5.9**	**90.6**	**4,431**	*
2016	A	-	-	-	0	-	-
	B	-	-	-	16.6	-	-
	C	212	17	6.0	15.5	547	96
	D	-	-	-	34.5	-	-
	E	162	22	1.0	9.5	1,481	329
	Total	**374**	**NA**	**7.0**	**76.1**	**2,031**	**425**
2017	A	78	29	2.3	13.2	441	128
	B	155	19	3.5	21.7	955	179
	C	21	20	2.4	26.3	228	46
	D	2	0	1.2	84.5	141	0
	E	-	-	-	0.1	0	0
	Total	**256**	**NA**	**9.5**	**145.8**	**1,765**	**350**

* no damage estimates provided for the 2015 fishery due to incomplete sampling during observer trips.

Other Catch in the Fishery

The discard rates of all species in the 2017 Scallop fishery are presented in Table 6. Most species are within ranges of discards observed in previous years. Some species had discard rates higher than has been previously observed: Brill (or Windowpane), Monkfish, and Silver Hake.

Table 6. Inshore Scallop discard rates for bycatch species in SFA 29 West for 2017. Discard rates are the weight of discards (kg) observed divided by the weight of Scallops (kg, meats) landed during the observed trips. Only species that were caught in 2017 are shown. For previous years' data, see Sameoto et al. (2015) and DFO (2016, 2017).

Species	Rate	Species	Rate	Species	Rate
American Lobster	0.026	Jellyfishes	<0.001	Silver Hake	<0.001
American Plaice	0.001	Jonah Crab	0.059	Sponges	0.050
Atlantic Rock Crab	0.098	Lemonweed	0.202	Starfish	0.083
Barnacles	0.001	Little, Winter Skate	0.017	Toad Crab	0.001
Brill/Windowpane	<0.001	Longhorn Sculpin	0.002	Unidentified Bivalves	0.074
Brittle Star	<0.001	Monkfish	0.054	Unidentified Sculpins	<0.001
Cephalopoda (Class).	<0.001	Ocean Pout	<0.001	Whelks	0.015
Clams	0.003	Sea Cucumbers	0.018	Winter Flounder	0.003
Cod	<0.001	Sea Raven	0.016	Witch Flounder	<0.001
Mussels	0.215	Sea Scallop	1.145	Yellowtail Flounder	<0.001
Hermit Crabs	0.002	-	-	-	-

Conclusions

In 2017, commercial biomass densities in Subareas C and D were in the Healthy Zone. The commercial biomass density in Subarea B declined in 2017 and is below the USR, in the Cautious Zone. Indications for Subarea E are that the population is neither increasing nor decreasing significantly at the current level of removals. For Subarea A, biomass declines are predicted even if no catch is taken in 2018.

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Appendix

*Appendix 1. Commercial scallop fishery landings, total allowable catch (TAC), and landings for Food, Social and Ceremonial purposes (FSC) by First Nations (meats, t) for Scallop Fishing Area (SFA) 29 West from 2011 to 2017. The TACs for Subareas A and E are sometimes combined. Dash (-) indicates no catch. * indicates preliminary data.*

Year	Subarea	TAC (t)	Landings (t)	FSC (t)	Total Landings (t)
2011	A	25.0	18.1	-	18.1
	E		5.6	-	5.6
	B	65.0	59.3	-	59.3
	C	45.0	45.5	-	45.5
	D	65.0	65.7	5.4	71.1
	Total	**200.0**	194.1	**5.4**	**199.5**
2012	A	25.0	1.0	-	1.0
	E		18.0	-	18.0
	B	60.0	76.8	4.2	81.0
	C	45.0	39.8	0.03	39.8
	D	30.0	31.7	0.4	32.2
	Total	**160.0**	167.3	**4.7**	**172.0**
2013	A	35.0	0.9	-	0.9
	E		13.5	-	13.5
	B	75.0	82.6	4.9	87.5
	C	25.0	18.3	-	18.3
	D	35.0	38.8	-	38.8
	Total	**170.0**	154.1	**4.9**	**159.0**
2014	A	45.0	3.0	-	3.0
	E		27.3	-	27.3
	B	90.0	98.1	5.3	103.4
	C	0.0	-	-	-
	D	0.0	-	-	-
	Total	**135.0**	128.4	**5.3**	**133.7**
2015	A	0	-	-	-
	E	27.0	27.3	0.4	27.7
	B	15.0	14.9	0.7	15.6
	C	15.0	13.2	1.4	14.6
	D	30.0	29.0	3.7	32.7
	Total	**87.0**	84.4	**6.2**	**90.6**
2016	A	0.0	-	-	-
	E	25.0	9.5	-	9.5
	B	15.0	16.6	-	16.6
	C	15.0	14.9	0.6	15.5
	D	20.0	31.5	3.0	34.5
	Total	**75.0**	**72.5**	**3.6**	**76.1**
2017*	A	15.0	13.2	-	13.2
	E	20.0	0.1	-	0.1
	B	29.0	21.7	-	21.7
	C	30.0	26.3	-	26.3
	D	46.0	74.6	9.9	84.5
	Total	**140.0**	**135.9**	**9.9**	**145.8**

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